

REMARKS/ARGUMENTS

Applicants submit this Amendment, together with a Supplemental Information Disclosure Statement Under 37 C.F.R. § 1.97(c) (“SIDS”) and a Petition for Extension of Time, in reply to the Office Action mailed March 9, 2004.

In this Amendment, Applicants amend claims 138, 139, 142-144, 146, 152, 153, 156-158, and 160 to better define the claimed invention. Applicants also add new claims 161-164.

Before entry of this Amendment, claims 87-108 and 133-160 were pending in this application. After entry of this Amendment, claims 87-108 and 133-164 are pending in this application.

The originally-filed specification, claims, abstract, and drawings fully support the amendments to claims 138, 139, 142-144, 146, 152, 153, 156-158, and 160 and the addition of new claims 161-164. No new matter was introduced.

In the Office Action, the Examiner withdrew claims 98-108 and 147-160 from consideration; rejected claims 89, 135, 136, 138, 139, 142, 143, and 145 under 35 U.S.C. § 112, ¶ 1; rejected claims 138, 139, 142, and 143 under 35 U.S.C. § 112, ¶ 1; rejected claims 138, 139, 142, and 143 under 35 U.S.C. § 112, ¶ 2; rejected claim 146 under 35 U.S.C. § 112, ¶ 2; rejected claims 87-91, 94-96, 133-137, and 141-146 under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Italian Patent Document No. 01,245,551 (“IT ’551”); rejected claims 87-91, 94-96, 133-137, and 141-146 under 35 U.S.C. § 103(a) as obvious over French Patent Document No. 2,187,808 (“FR ’808”); and rejected claims 87-92, 94-96, 133-137, and 141-146 under 35 U.S.C. § 103(a) as obvious over United Kingdom Patent Application No. 2,197,654 (“GB ’654”), Effect of Fillers and Moulding

Conditions On Properties of Self-Vulcanisable Blends of Epoxidised Natural Rubber and Carboxylated Nitrile Rubber by Alex et al. (“Alex”), and Japanese Patent Document No. 10-036,563 (“JP ’563”) in view of IT ’551 and U.S. Patent No. 5,462,979 to Sandstrom (“Sandstrom”).

Applicants traverse the Examiner’s rejections for at least the reasons discussed below.

Right of Priority and Benefit

In a Preliminary Amendment filed with the application on February 26, 2002, Applicants indicated that the present application is a continuation of International Patent Application No. PCT/EP00/07106, filed July 25, 2000, in the European Patent Office. However, the Office Action Summary (PTOL-326) for the Offices Actions mailed November 28, 2003, and March 9, 2004, do not appear to acknowledge this claim. Applicants respectfully request that the Examiner expressly acknowledge Applicants’ claim in the next paper mailed from the U.S. Patent and Trademark Office (“USPTO”).

Similarly, in the Preliminary Amendment, Applicants claimed the benefit under 35 U.S.C. § 365(c) based on patent application No. 99116676.0, filed August 26, 1999, in the European Patent Office. However, the Office Action Summary (PTOL-326) for the Offices Actions mailed November 28, 2003, and March 9, 2004, indicate that a certified copy of the priority document has not been received. Applicants submit a copy of a receipt card stamped on February 26, 2002, demonstrating that the certified copy was filed together with the application and Preliminary Amendment. As a result, Applicants respectfully request that the Examiner expressly acknowledge Applicants’ claim in the next paper mailed from the USPTO.

Section 112, ¶ 1, Rejection—Claims 89, 135, 136, 138, 139, 142, 143, and 145

Initially, Applicants note that the test of enablement is whether undue experimentation is necessary. M.P.E.P. 2164.01 (8th ed., Rev. 2, May 2004). Assuming, arguendo, that a range from “a⁺” to “b⁻” is enabled, Applicants submit that endpoints “a” and “b” are also enabled, barring a showing of undue experimentation.

Regarding claims 135 and 136, Applicants note that the specification at page 9, lines 12-15, recites “the epoxide equivalent weight of the epoxidized compound is usually between 40 and 2,000, preferably between 50 and 1,500, more preferably between 100 and 1,000” (emphasis added). Thus, the specification enables at least “between 40 and 2,000,” which includes 50, 50⁺ to 1,500⁻, and 1,500 (and 100, 100⁺ to 1,000⁻, and 1,000). The Examiner also tacitly admits that the specification enables 50⁺ to 1,500⁻ (and 100⁺ to 1,000⁻). Given that the specification enables both 50 and 1,500 (at least because “between 40 and 2,000” is enabled) and also enables 50⁺ to 1,500⁻, Applicants submit that the specification enables the recitation “wherein the epoxidized liquid organic compound has an epoxide equivalent weight greater than or equal to 50 and less than or equal to 1,500.” Similarly, given that the specification enables both 100 and 1,000 (at least because “between 40 and 2,000” is enabled) and also enables 100⁺ to 1,000⁻, Applicants submit that the specification enables the recitation “wherein the epoxidized liquid organic compound has an epoxide equivalent weight greater than or equal to 100 and less than or equal to 1,000.”

Regarding claim 89, Applicants note that the specification at page 16, line 35 - page 17, line 2, recites “reinforcing fillers, in an amount generally of between 20 and 120 phr, preferably between 40 and 90 phr” (emphasis added). Thus, values outside the range 20 phr to 120 phr are

clearly contemplated by the specification. And the Examiner tacitly admits that the specification enables 20^+ phr to 120^- phr. For at least the reason that the specification contemplates values outside the range 20 phr to 120 phr and also enables 20^+ phr to 120^- phr, Applicants submit that the specification enables the recitation “wherein an amount of the reinforcing filler is greater than or equal to 20 phr and less than or equal to 120 phr.” In addition, Applicants note that the Office Action tacitly acknowledges that the specification enables the claim 90 recitation “wherein an amount of the reinforcing filler is greater than or equal to 40 phr and less than or equal to 90 phr.”

Regarding claims 138 and 139, Applicants note that the specification at page 10, line 32 - page 11, line 2, recites “[t]hese oligomers generally have an average molecular weight (number-average) . . . of between 500 and 10,000, preferably between 1,000 and 8,000” (emphasis added). Thus, values outside the range 500 to 10,000 are clearly contemplated by the specification. And the Examiner tacitly admits that the specification enables 500^+ to $10,000^-$ (and $1,000$, $1,000^+$ to $8,000^-$, and 8,000). For at least the reason that the specification contemplates values outside the range 500 to 10,000 and also enables 500^+ to $10,000^-$, Applicants submit that the specification enables the recitation “wherein the epoxidized diene oligomer comprises an average molecular weight (number average) greater than or equal to 500 and less than or equal to 10,000.” Similarly, given that the specification enables both 1,000 and 8,000 (at least because “between 500 and 10,000” is enabled) and also enables $1,000^+$ to $8,000^-$, Applicants submit that the specification enables the recitation “wherein the epoxidized diene oligomer comprises an average molecular weight (number average) greater than or equal to 1,000 and less than or equal to 8,000.”

Regarding claims 142 and 143, Applicants note that the specification at page 13, lines 2-5, recites “[t]he average molecular weight of the base polymer is preferably between 2,000 and 1,000,000, preferably between 50,000 and 500,000” (emphasis added). Thus, values outside the range 2,000 to 1,000,000 are clearly contemplated by the specification. And the Examiner tacitly admits that the specification enables $2,000^+$ to $1,000,000^-$ (and $50,000$, $50,000^+$ to $500,000^-$, and $500,000$). For at least the reason that the specification contemplates values outside the range 2,000 to 1,000,000 and also enables $2,000^+$ to $1,000,000^-$, Applicants submit that the specification enables the recitation “wherein the elastomeric polymer containing carboxylic groups has an average molecular weight (number average) greater than or equal to 2,000 and less than or equal to 1,000,000.” Similarly, given that the specification enables both 50,000 and 500,000 (at least because “between 2,000 and 1,000,000” is enabled) and also enables $50,000^+$ to $500,000^-$, Applicants submit that the specification enables the recitation “wherein the elastomeric polymer containing carboxylic groups has an average molecular weight (number average) greater than or equal to 50,000 and less than or equal to 500,000.”

Regarding claim 145 (and amended claim 144), Applicants note that the specification at page 16, lines 29-33, recites “[i]n general, the amount of epoxidized liquid compound can range between 5 and 200 parts by weight, preferably between 10 and 120 parts by weight, per 100 parts by weight of elastomeric polymer” (emphasis added). Thus, values outside the range 5 parts-by-weight to 200 parts-by-weight are clearly contemplated by the specification. For at least the reason that the specification contemplates values outside the range 5 parts-by-weight to 200 parts-by-weight and also enables 5^+ parts-by-weight to 200^- parts-by-weight, Applicants submit that the specification enables the recitation “wherein an amount of the epoxidized liquid

organic compound is greater than or equal to 5 parts-by-weight per 100 parts-by-weight of elastomeric polymer and less than or equal to 200 parts-by-weight per 100 parts-by-weight of elastomeric polymer.” Similarly, given that the specification enables both 10 and 120 (at least because “between 5 and 200 parts by weight” is enabled) and also enables 10^+ to 120^- , Applicants submit that the specification enables the recitation “wherein an amount of the epoxidized liquid organic compound is greater than or equal to 10 parts-by-weight per 100 parts-by-weight of elastomeric polymer and less than or equal to 120 parts-by-weight per 100 parts-by-weight of elastomeric polymer.”

Section 112, ¶ 1, Rejection—Claims 138, 139, 142, and 143

Applicants amend claim 138 and 139 to recite that the average molecular weight is based on number average, as discussed in the specification on page 10 at line 33. Applicants similarly amend claims 152 and 153.

Applicants amend claim 142 and 143 to recite that the average molecular weight is based on number average, consistent with the average molecular weight discussion related to epoxidized diene oligomers. Applicants similarly amend claims 156 and 157.

Section 112, ¶ 2, Rejection—Claims 138, 139, 142, and 143

As discussed above, Applicants amend claims 138, 139, 152, and 153 to recite that the average molecular weight is based on number average, as discussed in the specification on page 10 at line 33.

As also discussed above, Applicants amend claims 142, 143, 156, and 157 to recite that the average molecular weight is based on number average, consistent with the average molecular weight discussion related to epoxidized diene oligomers.

Section 112, ¶ 1, Rejection—Claim 146

Applicants amend claim 146 substantially as suggested by the Examiner in order to advance prosecution of the application. Applicants similarly amend claim 160.

Other Claim Amendments

Applicants amend claims 144 and 158 to parallel the language of claims 145 and 159, consistent with the discussion above under the heading Section 112, ¶ 1, Rejection—Claims 89, 135, 136, 138, 139, 142, 143, and 145.

Section 102(b) Rejection—Independent Claim 87

Applicants submit that independent claim 87 is not anticipated under 35 U.S.C. § 102(b) by IT '551.

For anticipation under 35 U.S.C. § 102(b), the reference must teach every aspect of the claimed invention either explicitly or impliedly. See MPEP 706.02, Subsection IV (8th ed., Rev. 2, May 2004). However, Applicants submit that IT '551 does not teach every aspects of independent claim 87, including, inter alia, “an elastomeric polymer containing carboxylic groups crosslinked by reaction with an epoxidized liquid organic compound containing epoxide groups located internally on a molecule of the organic compound.”

Applicants submit that the epoxidized natural rubbers (EPOXIPRENE 25[™] and EPOXIPRENE 50[™]) discussed in IT '551 on page 10 and page 16, example 5, are not epoxidized liquid organic compounds containing epoxide groups located internally on a molecule of the organic compound. As explained in the specification of the present invention, IT '551 merely discloses the use of epoxidized natural rubbers, which can be crosslinked, and therefore does not qualify as a “crosslinked elastomeric material” of the claims. Further, the epoxidized natural

rubbers of IT '551 are crosslinked by reaction with compounds of the formula R1-R-R2, which are not epoxidized liquid organic compounds. Accordingly, the resultant crosslinked material is also not the “crosslinked elastomeric material” of the claims. Moreover, Applicants have shown unexpected improved properties using the claimed “epoxidized liquid organic compound containing epoxide groups located internally on a molecule of the organic compound” over using epoxidized natural rubbers.

Because IT '551 does not teach, either explicitly or impliedly, all aspects of claim 87, Applicants submit that independent claim 87 is not anticipated under 35 U.S.C. § 102(b) by IT '551.

Section 102(b) Rejection—Dependent Claims 88-91, 94-96, 133-137, and 141-146

Applicants submit that dependent claims 88-91, 94-96, 133-137, and 141-146 are not anticipated under 35 U.S.C. § 102(b) by IT '551, at least due to the direct or indirect dependency of claims 88-91, 94-96, 133-137, and 141-146 from independent claim 87.

Section 103(a) Rejection—Independent Claim 87—IT '551

Applicants submit that independent claim 87 is not obvious under 35 U.S.C. § 103(a) over IT '551.

To establish a prima facie case of obviousness under 35 U.S.C. § 103(a) using a single reference, each of three requirements must be met. First, the reference must teach or suggest all the claim limitations. M.P.E.P. 2143.03 (8th ed., Rev. 2, May 2004). Second, there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference in a manner resulting in the claimed invention. M.P.E.P. 2143.01 (8th ed., Rev. 2, May 2004). Third, there must be a

reasonable expectation of success that the proposed modification would work for the intended purpose. M.P.E.P. 2143.02 (8th ed., Rev. 2, May 2004). Moreover, the second and third requirements “must both be found in the prior art, not in applicant’s disclosure.” M.P.E.P. 2143 (8th ed., Rev. 2, May 2004).

However, as discussed above, Applicants submit that IT ’551 does not teach all the limitations of claim 87 including, inter alia, “an elastomeric polymer containing carboxylic groups crosslinked by reaction with an epoxidized liquid organic compound containing epoxide groups located internally on a molecule of the organic compound.” Nor does IT ’551 suggest all the limitations of claim 87. Further, Table 7 of the specification of the present invention discloses comparative examples 22-24 in which the epoxidized liquid organic compound (PARAPLEX[®] G-60) of example 20 is replaced with EPOXYPRENE[®] ENR 50. As shown in Table 7, comparative examples 22-24 have poor processability (high Mooney viscosity), low elongation at break, and inferior dynamic performance qualities (i.e., Tan delta at 0° C beyond limit of measuring instrument).

For at least these reasons, Applicants submit that independent claim 87 is not obvious under 35 U.S.C. § 103(a) over IT ’551.

Section 103(a) Rejection—Dependent Claims 88-91, 94-96, 133-137, and 141-146—IT ’551

Applicants submit that dependent claims 88-91, 94-96, 133-137, and 141-146 are not obvious under 35 U.S.C. § 103(a) over IT ’551, at least due to the direct or indirect dependency of claims 88-91, 94-96, 133-137, and 141-146 from independent claim 87.

Section 103(a) Rejection—Independent Claim 87—FR '808

Applicants submit that independent claim 87 is not obvious under 35 U.S.C. § 103(a) over FR '808.

As discussed above, to establish a prima facie case of obviousness under 35 U.S.C. § 103(a) using a single reference, each of three requirements must be met. However, Applicants submit that FR '808 does not teach all the limitations of claim 87 including, inter alia, “wherein at least one of the components comprises, as the crosslinked elastomeric material, an elastomeric polymer containing carboxylic groups crosslinked by reaction with an epoxidized liquid organic compound containing epoxide groups located internally on a molecule of the organic compound” and “wherein the elastomeric polymer containing carboxylic groups is crosslinked substantially in an absence of additional crosslinking agents.” Nor does FR '808 suggest all the limitations of claim 87.

Applicants submit that the polycarboxylated polymer of FR '808 is not crosslinked by reaction with the aliphatic or aromatic diepoxide resin, rather the aliphatic or aromatic diepoxide resin acts to elongate the chains of the polycarboxylated polymer. Auxiliary vulcanization (i.e., crosslinking) is provided by sulfur or peroxide. Moreover, the diepoxide resins discussed on page 3 of FR '808 contain epoxide groups located externally, not internally as required by the claims. Additionally, Table 3 of the specification of the present invention discloses comparative examples 14 and 15 in which the epoxidized liquid organic compound (PARAPLEX[®] G-60) of example 16 is replaced with EUREPOX[®] 710 or EUREPOX[®] 720 LV. Upon information and belief, these epoxy resins contain epoxide groups located externally, not internally. As shown in Table 3, comparative examples 14 and 15 have poor processability (high Mooney viscosity), low

elongation at break, and dynamic modulus values that vary dramatically with temperature (this thermoplasticity is of fundamental importance in the manufacture of tyres).

Thus, FR '808 does not teach or suggest all the limitations of claim 87. For at least this reason, Applicants submit that independent claim 87 is not obvious under 35 U.S.C. § 103(a) over FR '808.

Section 103(a) Rejection—Dependent Claims 88-91, 94-96, 133-137, and 141-146—FR '808

Applicants submit that dependent claims 88-91, 94-96, 133-137, and 141-146 are not obvious under 35 U.S.C. § 103(a) over FR '808, at least due to the direct or indirect dependency of claims 88-91, 94-96, 133-137, and 141-146 from independent claim 87.

Section 103(a) Rejection—Independent Claim 87—Sandstrom,
GB '654, IT '551, JP '563, and Alex

Applicants submit that independent claim 87 is not obvious under 35 U.S.C. § 103(a) over Sandstrom, GB '654, Alex, IT '551, and JP '563.

To establish a prima facie case of obviousness under 35 U.S.C. § 103(a) using multiple references, each of three requirements must be met. First, the references, when combined, must teach or suggest all the claim limitations. M.P.E.P. 2143.03 (8th ed., Rev. 2, May 2004). Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references in a manner resulting in the claimed invention. M.P.E.P. 2143.01 (8th ed., Rev. 2, May 2004). Third, there must be a reasonable expectation of success that the proposed combination would work for the intended purpose. M.P.E.P. 2143.02 (8th ed., Rev. 2, May 2004). Moreover, the second and third requirements “must both be found in the prior art, not in applicant’s disclosure.” M.P.E.P. 2143 (8th ed., Rev. 2, May 2004).

However, Applicants submit that no proper combination of Sandstrom, GB '654, Alex, IT '551, and JP '563 teaches or suggests all the limitations of claim 87 including, inter alia, “wherein at least one of the components comprises, as the crosslinked elastomeric material, an elastomeric polymer containing carboxylic groups crosslinked by reaction with an epoxidized liquid organic compound containing epoxide groups located internally on a molecule of the organic compound” and “wherein the elastomeric polymer containing carboxylic groups is crosslinked substantially in an absence of additional crosslinking agents.”

Regarding Sandstrom, Applicants submit that it discloses a sulfur-cured rubber composition. Thus, the combination of Sandstrom with GB '654, Alex, IT '551, and JP '563, by one of ordinary skill in the art of tyre production likely would result in a composition crosslinked with sulfur, in contrast to the claim 87 recitation “wherein the elastomeric polymer containing carboxylic groups is crosslinked substantially in an absence of additional crosslinking agents.”

Regarding GB '654, Applicants note that page 6, lines 8-11, discloses that “[c]onventional vulcanization is avoided, and a product is produced which may be melted again for combination with other ingredients or for forming into a finished product.” Applicants submit that the thermoplastic elastomers of GB '654 are not useful for tyre production, where a high degree of crosslinking is required and reversion phenomena should be avoided. Thus, one of ordinary skill in the art of tyre production would not look to GB '654.

Regarding Alex, Applicants submit that its epoxidized natural rubber (EPOXIPRENE 50TM) is not “an epoxidized liquid organic compound containing epoxide groups located internally on a molecule of the organic compound” for reasons similar to those discussed above related to Table 7 of the specification of the present invention. Similarly, regarding

IT '551, as discussed above, Applicants submit that its epoxidized natural rubbers (EPOXIPRENE 25TM and EPOXIPRENE 50TM) are not epoxidized liquid organic compounds containing epoxide groups located internally on a molecule of the organic compound. Thus, the combination of Alex and/or IT '551 with Sandstrom, GB '654, and JP '563 by one of ordinary skill in the art of tyre production likely would result in a composition without an epoxidized liquid organic compound containing epoxide groups located internally on a molecule of the organic compound, in contrast to the claim 87 recitation “an elastomeric polymer containing carboxylic groups crosslinked by reaction with an epoxidized liquid organic compound containing epoxide groups located internally on a molecule of the organic compound.”

Thus, no proper combination of Sandstrom, GB '654, Alex, IT '551, and JP '563 teaches or suggests all the limitations of claim 87. For at least this reason, Applicants submit that independent claim 87 is not obvious under 35 U.S.C. § 103(a) over Sandstrom, GB '654, Alex, IT '551, and JP '563.

Section 103(a) Rejection—Dependent Claims 88-92, 94-96, 133-137,
and 141-146—Sandstrom, GB '654, IT '551, JP '563, and Alex

Applicants submit that dependent claims 88-92, 94-96, 133-137, and 141-146 are not obvious under 35 U.S.C. § 103(a) over Sandstrom, GB '654, IT '551, JP '563, and Alex, at least due to the direct or indirect dependency of claims 88-92, 94-96, 133-137, and 141-146 from independent claim 87.

New Claims 161-164

New claims 161-164 are supported in the originally-filed specification at least at page 17, line 27 - page 18, line 22. Claims 161 and 162 correspond to Group III and to each of the three provisional elections of species (acrylonitrile/butadiene/carboxylate monomer terpolymer

Nipol EP[®] 107; epoxidized soybean oil Paraplex[®] G-60; and reinforcing filler precipitated silica Zeosil[®] 1165 MP). Claims 163 and 164 correspond to Group IV and to each of the three provisional elections of species (acrylonitrile/butadiene/carboxylate monomer terpolymer Nipol EP[®] 107; epoxidized soybean oil Paraplex[®] G-60; and reinforcing filler precipitated silica Zeosil[®] 1165 MP).

Applicants submit that claims 161-164 are not anticipated by or obvious over the cited art for reasons similar to those related to claim 145 (and claim 160).

Claim Scope

In discussing the specification, claims, abstract, and drawings in this Amendment, it is to be understood that Applicants are in no way intending to limit the scope of the claims to any exemplary embodiments described in the specification or abstract and/or shown in the drawings. Rather, Applicants believe that Applicants are entitled to have the claims interpreted broadly, to the maximum extent permitted by statute, regulation, and applicable case law.

Summary

In view of the foregoing amendments and remarks, Applicants respectfully request the reconsideration and reexamination of this Application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

A handwritten signature in black ink, appearing to read 'LFG', is written over a horizontal line.

By: _____

Lawrence F. Galvin
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Dated: September 8, 2004